

Karthik Pullalarevu

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EDUCATION

Carnegie Mellon University

Pittsburgh, PA

Master of Science in Computer Vision, Robotics Institute.

August 2025 – December 2026

Courses: Advanced Computer Vision, 3D Vision, Reinforcement Learning

Vellore Institute of Technology

Chennai, India

Bachelor in Computer Science & Electronics – CGPA 9.17/10

July 2018 – May 2022

Courses: Machine Learning, Data Structures and Algorithms, Micro-controllers

EXPERIENCE

HyperVerge *[200-member, bootstrapped and profitable AI startup]*

Bangalore, India

Lead Machine Learning Engineer (MLE 3)

January 2022 – August 2025

- Led R&D for the Face Fraud Detection team, a core product **generating 30% of company revenue** across India, APAC, and Africa; built and optimized **10+ vision models** for face quality assessment and spoof detection.
- Developed and released custom ViT-based models for face spoof and deepfake detection, achieving **0.15% FAR & 0.06% FRR**, serving **20 million verifications monthly** in production.
- Built efficient multi-modal transformer models using language, depth, and video modalities; experimented with distance metrics to **improve generalizability against unseen attacks**.
- Reduced model size from **335MB to 28MB** and cut CPU **inference latency by 60%** through tailored quantization techniques (distillation + pruning), enabling real-time on-device deployment.
- Created an ANN-based anomaly detection model using mobile sensor data, **eliminating image injection attacks from 200/week to 0** within a month.
- Built an **LLM powered hiring agent** that parsed resumes, scored candidates, and conducted automated interviews to assess AI fundamentals, **cutting hiring time by 96%** and **cost by 65%**.
- Tech Stack:** Generative AI, Vision Transformers, GANs, LLMs, AWS, Docker, ONNX, Multimodal data, PyTorch

ÉTS Montreal

Montreal, Canada

Research Intern *[Guide - Dr. Hervé Lombaert]*

August 2021 – December 2021

- Key Contributions to research on Graph CNNs for cortical shape analysis, increasing brain parcellation accuracy by 3%.
- Developed an efficient Python pipeline for spectral alignment of brain mesh surfaces. [\[code\]](#) [\[certificate\]](#) [\[presentation\]](#)

Agency for Science, Technology and Research

Remote, Singapore

Research Intern *[Guide - Dr. Renuga Kanagavelu]*

June 2021 – November 2021

- Developed federated learning simulation with two clients for semantic segmentation of live tumor using Flower platform.
- Led end-to-end solution, drove experiment design, metric definition and visual analysis resulting in a Dice score of 0.793.

Tata Consultancy Services - Research Labs

Noida, India

Machine Learning Intern

May 2021 – August 2021

- Built 2D/3D U-Nets to segment hepatic vessels from CT scans for non-invasive diagnosis of portal hypertension.
- Applied preprocessing techniques like contrast enhancement, windowing, and domain adaptation from veins to vessels, achieving a Dice score of 0.53. **Tech stack : Convolution Neural Networks, Image Processing, Computer Vision**

TECHNICAL SKILLS

Programming Languages: Python (Advanced); C++, R, Java, MySQL (Intermediate)

Frameworks and Tools: PyTorch, Docker, Git, Timm, Numpy, Pandas, Huggingface Transformers, TensorFlow, OpenCV, AWS, ONNX, Scikit-Learn, Spark

Computer Vision: Vision Transformers, Diffusion models, Novel View Synthesis, Neural Radiance Fields, Semantic Segmentation, 3D Reconstruction, Monocular Depth Estimation, Multimodal Models, GANs

PUBLICATIONS & PATENTS

- Method And System For Determining Liveness of a Subject. [Non-Provisional Stage - USPTO]
- Method And System of Video Processing For Determining Liveness of a Subject. [Non-Provisional Stage - USPTO]
- Method And System of Image Processing For Determining Liveness of a Subject. [Non-Provisional Stage - USPTO]
- Karthik, P.**, Parashar, M., Reka, S.S. et al. Semantic segmentation for plant phenotyping using advanced deep learning pipelines. *Multimedia Tools & Appl* [[10.1007/s11042-021-11770-7](#)]
- Karthik, P.**, Parashar, M., Reka, S.S. Robust Deep learning Model for Detection of Tomato Bacterial Spot on Novel Dataset. *Scientific Reports* [Under Review]

RESEARCH PROJECTS

Multiview pose synthesis from 2D objects | *Diffusion models, Novel View Synthesis, Neural Radiance Fields*

- Developed an end-end approach to edit pose of an object in a 2D image given the azimuth and polar values.
- The pipeline includes text-guided segmentation, image to 3D view generation followed by Stable Diffusion Inpainting and replacing the generated object in the masked image. [\[code\]](#)

Quantification of COVID-19 chest CT scans - Mayo Clinic | *Machine Learning, Optimisation*

- Extracted tracheal regions from 600+ COVID-19 patient CT volumes using the airway extractor module in Slicer 3D software. Applied feature engineering techniques (Lasso, Boruta) and trained models (logistic regression, SVM, decision trees) to quantify tracheal infection. (Guide: [Dr. Rajagopalan Srinivasan](#))